

Received : June 30, 2022
Accepted : July 07, 2022
Published : September 30, 2022

Conference on Business, Social Sciences and Technology
<https://journal.uib.ac.id/index.php/conescintech>

Observation Of Diaphragm Wall As Retaining Wall In The Leuwikeris Area

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Abstract

The leuwikeris dam area was a rural area near the river. The main dam of this project is located in Ancol Village, Cineam District, Tasikmalaya Regency, and West Java Province. Leuwikeris Dam was built by damming the Citanduy river which has upstream rivers in the Cakrabuana mountains and downstream rivers in Cilacap Regency. The purpose of this article is to provide an overview of observations, shapes, and configurations of retaining wall structures. Diaphragm wall provides a more minimal seepage effect in other methods such as secant pile. Secant pile has only the same uses but vast area difference. This article tries to give a broad overview of the diaphragma wall of the leuwikeris dam.

Keyword : Dam, Diaphragm Wall, Wall, Project.

Introduction

The diaphragm wall is a type of inner foundation that has a function as water tight and handles seepage. The entire leuwikeris dam occupies a large area of the 166m dam. A 49 panel dam construction project in the leuwikeris tasik dam area. Overall it was completed in about 4 Months (120 Calendar Days) and construction implementation began on August 8, 2021 until December 8, 2021, when the project was carried out 11 hours a day. In working on the project, the dam construction project with 49 panels in the Leuwikeris Tasik area, the authors review the work method using the cut of wall method.

Literatur Review

Diaphragm wall is a kind of permanent retaining wall structure to provide lateral support to the unsafe soil mass during excavation. It is slurry bentonite gain wall embedded earth retaining structure. Previous research on the Diaphragm wall construction was conducted by Aakash Rajesh Kumar Suthar and Y S Patel in march 2020. The titled "Deflection on Diaphragm Wall Because of Site Condition, Soil Condition, Construction Technique & Seismic Load".

Method

The diaphragm and wall is a type of inner foundation that has a function as water tight and handles seepage. Generally the diaphragm wall has a 3 function of STRUCTURAL WALL, load bearing wall, cut of wall. Before working on the diaphragm wall there is pumping test. the purpose of checking the effectiveness of Diaphragm Wall. Cut of wall has a function as water tight and handles seepage for such conditions as dam under, bulging and structural construction needs. The project was targeted complete about 4 Months (120 Calendar Days) and construction starts was on August 8, 2021 until December 8, 2021, the daily project was carried 11 hours a day. the dam construction project with 49 panels in the Leuwikeris Tasik area, as project engineer was reviewed daily using cut of wall method. The leuwikeris dam is one that has a distinctive design. Leuwikeris dam

is a stone fixed dam with this vertical clay zone, containing 2 filters upstream and downstream. Leuwikeris dam formation materials are rockfill, random alluvial, excavated, spillway, maindam digging, and a rip rap.

SPESIFIKASI RENCANA D-WALL:

Depth L = 45 m, Tebal 800 mm, Sepanjang 166 m, Join 0.4 m

Panel Primer Efektif 2 m – 2.4 m + Panel Sekunder 2.8 m (Guide Wall H-Beam)

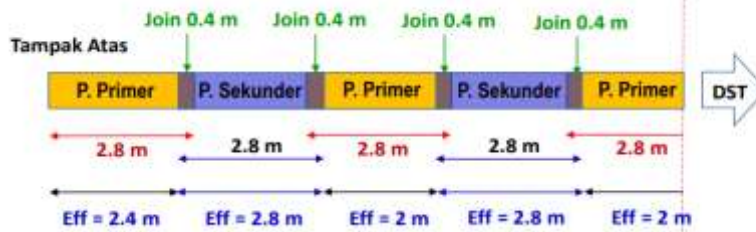


Figure 1 Specification Diaphragm Wall Primer and Secondary

Result and Discussion

Guide wall is the first stage of implementing the Diaphragm wall project. Guide Wall is 2 parallel beams of reinforced concrete on the side of the wall as a reference that will be used when conducting temporary wall experiments. After making the Guide wall, then the pumping test is used as a test for pumping water into the ground through pumping wells. The discharge pumping test conducted called the well test to determine the pattern of air flow below the surface. The diaphragm wall pumping test is carried out for 5 hours.

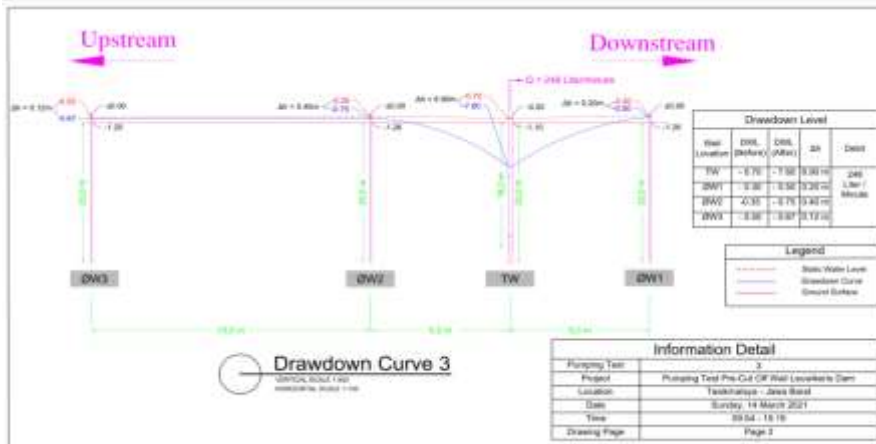


Figure 2 Drawdown Level Pumping Test

After fixing the pump, prepare a bentonite slurry as a retaining wall to prevent landslides. The handling of seepage or seepage that occurs in the foundation of the dam is done by injection of cement slurry (bentonite) into the soil or rock cavities with the intention of stopping and reducing seepage flow.

Table 1 Specification Slurry Bentonite

PROPERTIES	BENTONITE SLURRY
Viscosity	35 – 45 Second
Density	1.03 – 1.37 g/cm ³
Ph	6.5 – 11
Water & Bentonite	1000 Lt & 90 kg

After preparing the bentonite slurry, followed by diaphragm wall. Grabbing Clamp length 2800mm and width 800mm with a straight soil depth with a minimum slope of 1%. Along with carrying out this excavation, the

interaction of water and bentonite was carried out on an ongoing basis, so that soil does not occur. The grabbing has been carried out, then followed by verticality test. Verticality test as the data of the depth of the soil surface. Researchers designed the depth of the ground that has been grabbed and verticality test. The goal is to determine the length and depth of the soil, how high the level of the diaphragm wall plumb, and the perforation of the diaphragm wall foundation. The depth of the diaphragm wall excavation is adjusted to the needs of the underpass depth.

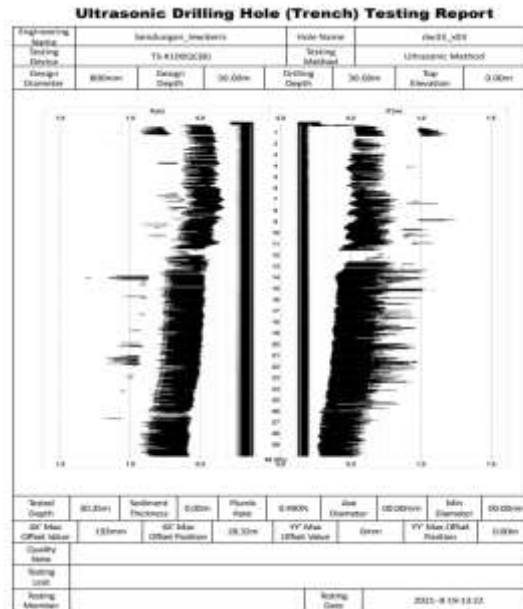


Figure 3 data Verticality Test

Upon getting the verticality test data, an airlift was carried out. In casting the diaphragm wall there to answer deposition of material. Air lift is an activity to remove dirt or soil sediment after the verticality test. Then installation tremie pipe was done followed by casting.

Conclusions

Activities carried out during practical work were observing as an engineer and administration of the Dileuwikeris dam project area. During this practical work the following conclusions can this drawn:

1. Handling of seepage or seepage that occurs at the Leuwikeris Dam foundation is carried out by injection of cement slurry (bentonite) into soil or rock cavities with the intention of stopping and reducing seepage flow.
2. Pumping test data: drawdown level and water discharge at the Leuwikeris dam which can be seen in the table below.

Table 2 Drawdown Level Test Information

Drawdown Level Test Information				
Well Location	DWL Before (m)	DWL After (m)	Δh (m)	Debit
TW	- 0.42	- 7.35	6.93	248
OW1	- 0.24	- 0.38	0.09	Liter/
OW2	- 0.29	- 0.66	0.37	Minute
OW3	- 0.57	- 0.66	0.14	

3. Verticality tested as the data of the depth of the soil surface. Researchers designed the depth of the ground that has been grabbed and verticality test. The goal is to determine the length and depth of the soil, plumb RATE, and the perforation of the diaphragm wall foundation.

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